Exhibit E

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Terms

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Editor in Chief

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On the cover: Photomicrograph of crystals of vitamin B_1.
(*Dennis Kunkel, University of Hawaii*)

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reactor to that supplied by a neutron source; it is the factor by which, in effect, the reactor multiplies the source strength { ,məl·tə·pli'kā·shən }

multiplication constant *See* multiplication factor. { ,məl·tə·pli'kā·shən 'kän·stənt }

multiplication factor [NUCLEO] The ratio of the number of neutrons present in a reactor in any one neutron generation to that in the immediately preceding generation. Also known as multiplication constant; neutron multiplication factor. { ,məl·tə·pli'kā·shən ,fak·tər }

multiplication on the left *See* premultiplication. { məl·tə·pli'kā·shən ȯn thə 'left }

multiplication on the right *See* postmultiplication. { ,məl·tə·pli'kā·shən ȯn thə 'rīt }

multiplication sign [MATH] The symbol × or ·, used to indicate multiplication. Also known as times sign. { ,məl·tə·pli'kā·shən ,sīn }

multiplication table [COMPUT SCI] In certain computers, a part of memory holding a table of numbers in which the computer looks up values in order to perform the multiplication operation. { ,məl·tə·pli'kā·shən ,tā·bəl }

multiplication time [COMPUT SCI] The time required for a computer to perform a multiplication; for a binary number it will be equal to the total of all the addition times and all the shift times involved in the multiplication. { ,məl·tə·pli'kā·shən ,tīm }

multiplicative acoustic array [ACOUS] An acoustic array of receiving elements which is divided into two parts, the signal voltages obtained from them being multiplied together. Also known as correlation array. { ,məl·tə'plik·əd·iv ə'küs·tik ə'rā }

multiplicative congruential generator [COMPUT SCI] A congruential generator in which the constant b in the generating formula is equal to zero. { ,məl·tə'plik·əd·iv ,kän,grü'en·chəl 'jen·ə,rād·ər }

multiplicative identity [MATH] In a mathematical system with an operation of multiplication, denoted ×, an element I such that $I \times e = e \times I = e$ for any element e in the system. { ,məl·tə'plik·əd·iv ī'den·əd·ē }

multiplicative inverse [MATH] In a mathematical system with an operation of multiplication, denoted ×, the multiplicative inverse of an element e is an element $\bar{e}$ such that $e \times \bar{e} = \bar{e} \times e = 1$, where 1 is the multiplicative identity. { ,məl·tə'plik·əd·iv 'in,vərs }

multiplicative subset [MATH] A subset S of a commutative ring such that if x and y are in S then so is xy. { ,məl·tə'plik·əd·iv 'səb,set }

multiplicity [MATH] **1.** A root of a polynomial $f(x)$ has multiplicity n if $(x − a)^n$ is a factor of $f(x)$ and n is the largest possible integer for which this is true. **2.** The geometric multiplicity of an eigenvalue λ of a linear transformation T is the dimension of the null space of the transformation $T − \lambda I$, where I denotes the identity transformation. **3.** The algebraic multiplicity of an eigenvalue λ of a linear transformation T on a finite-dimensional vector space is the multiplicity of λ as a root of the characteristic polynomial of T. [PHYS] In a system having Russell-Saunders coupling, the quantity $2S + 1$, where S is the total spin quantum number. { ,məl·tə'plis·əd·ē }

multiplier [ELEC] A resistor used in series with a voltmeter to increase the voltage range. Also known as multiplier resistor. [ELECTR] **1.** A device that has two or more inputs and an output that is a representation of the product of the quantities represented by the input signals; voltages are the quantities commonly multiplied. **2.** *See* electron multiplier. **3.** *See* frequency multiplier. [MATH] If a number x is to be multiplied by a number y, then y is called the multiplier. { 'məl·tə,plī·ər }

multiplier field [COMPUT SCI] The area reserved for a multiplication, equal to the length of multiplier plus multiplicand plus one character. { 'məl·tə,plī·ər ,fēld }

multiplier phototube [ELECTR] A phototube with one or more dynodes between its photocathode and the output electrode; the electron stream from the photocathode is reflected off each dynode in turn, with secondary emission adding electrons to the stream at each reflection. Also known as electron-multiplier phototube; photoelectric electron-multiplier tube; photomultiplier; photomultiplier tube. { 'məl·tə,plī·ər 'fōd·ō,tüb }

multiplier-quotient register [COMPUT SCI] A register equal to two words in length in which the quotient is developed and in which the multiplier is entered for multiplication. { 'məl·tə,plī·ər 'kwō·shənt ,rej·ə·stər }

multiplier resistor *See* multiplier. { 'məl·tə,plī·ər ri,zis·tər }

multiplier traveling-wave photodiode [ELECTR] Photodiode in which the construction of a traveling-wave tube is combined with that of a multiplier phototube to give increased sensitivity. { 'məl·tə,plī·ər ,trav·ə·liŋ 'wāv ,fōd·ō'dī,ōd }

multiplier tube [ELECTR] Vacuum tube using secondary emission from a number of electrodes in sequence to obtain increased output current; the electron stream is reflected, in turn, from one electrode of the multiplier to the next. { 'məl·tə,plī·ər ,tüb }

multipling [COMMUN] Use of multidrop lines to provide for changes in telephone service patterns or requirements; unused terminals afford convenient access to wiretappers. { 'məl·tə·pliŋ }

multiply connected region [MATH] An open set in the plane which has holes in it. { 'məl·tə·plē kə'nek·təd 'rē·jən }

multiply defined symbol [COMPUT SCI] Common assembler or compiler error printout indicating that a label has been used more than once. { 'məl·tə·plē di'fīnd 'sim·bəl }

multiply perfect number [MATH] An integer such that the sum of all its factors is a multiple of the integer itself. { 'məl·tə·plē ¦pər·fikt 'nəm·bər }

multipoint line [COMMUN] A line which is shared by two or more different tributary stations. { 'məl·tə,pȯint ,līn }

multipolar [ELECTROMAG] Having more than one pair of magnetic poles. { məl·tə'pō·lər }

multipolar machine [ELECTROMAG] An electric machine that has a field magnet with more than one pair of poles. { ¦məl·tə'pō·lər mə'shēn }

multipole [ELECTROMAG] One of a series of types of static or oscillating distributions of charge or magnetization; namely, an electric multipole or a magnetic multipole. { 'məl·tə,pōl }

multipole fields [ELECTROMAG] The electric and magnetic fields generated by static or oscillating electric or magnetic multipoles. { 'məl·tə,pōl ,fēlz }

multipole radiation [PHYS] **1.** Electromagnetic radiation which has characteristics equivalent to those of radiation generated by an oscillating electric or magnetic multipole, and is made up of photons of well-defined angular momentum and parity. **2.** Internal conversion electrons, or positron-electron pairs having similar characteristics, emitted from an atom when the nucleus makes a transition between two energy states. { 'məl·tə,pōl ,rād·ē'ā·shən }

multipole transition [PHYS] A transition between two energy states of an atom or nucleus in which a quantum of multipole radiation is emitted or absorbed. { 'məl·tə,pōl tran'zish·ən }

multiport burner [ENG] A burner having several nozzles which discharge fuel and air. { 'məl·tə,pȯrt 'bər·nər }

multiport memory [COMPUT SCI] A memory shared by many processors to communicate among themselves. { 'məl·tə,pȯrt 'mem·rē }

multiport network analyzer [ENG] A linear, passive microwave network having five or more ports which is used for measuring power and the complex reflection coefficient in a microwave circuit. Also known as multiport reflectometer. { 'məl·tə,pȯrt ¦net,wərk 'an·ə,līz·ər }

multiport reflectometer *See* multiport network analyzer. { 'məl·tə,pȯrt ,rē,flek'täm·əd·ər }

multiprecision arithmetic [COMPUT SCI] A form of arithmetic similar to double precision arithmetic except that two or more words may be used to represent each number. { ¦məl·tə·prə'sizh·ən ə'rith·mə,tik }

multiprocessing [COMPUT SCI] Carrying out of two or more sequences of instructions at the same time in a computer. { ,məl·tə'prä,ses·iŋ }
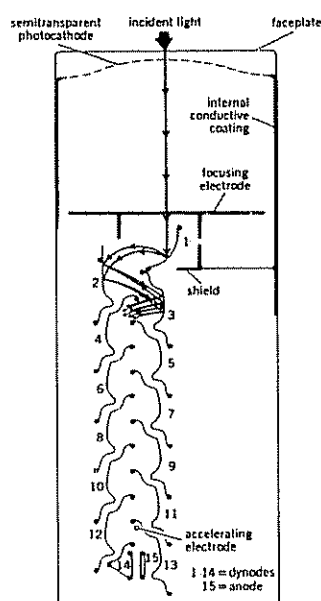
multiprocessing system *See* multiprocessor. { ,məl·tə'prä,ses·iŋ ,sis·təm }

multiprocessor [COMPUT SCI] A data-processing system that can carry out more than one program, or more than one arithmetic operation, at the same time. Also known as multiprocessing system. { ,məl·tə'prä,ses·ər }

multiprocessor interleaving [COMPUT SCI] Technique used to speed up processing time; by splitting banks of memory each with x microseconds access time and accessing each one in sequence $1/n$-th of a cycle later, a reference to memory can be had every x/n microseconds; this speed is achieved at the cost of hardware complexity. { ,məl·tə'prä,ses·ər ,in·tər'lēv·iŋ }

multiprogramming [COMPUT SCI] The interleaved execution of two or more programs by a computer, in which the central

MULTIPLIER PHOTOTUBE

semitransparent photocathode / incident light / faceplate

Internal conductive coating

focusing electrode

shield

accelerating electrode

1·14 = dynodes
15 = anode

Typical multiplier phototube construction.

wave-cut cliff [GEOL] A cliff formed by the erosive action of waves on rock. { 'wāv ¦kət ¦klif }

wave-cut notch [GEOL] An indentation cut into a sea cliff at water level by wave action. { 'wāv ¦kət 'näch }

wave-cut plain *See* wave-cut platform. { 'wāv ¦kət 'plān }

wave-cut platform [GEOL] A gently sloping surface which is produced by wave erosion and which extends into the sea for a considerable distance from the base of the wave-cut cliff. Also known as cut platform; erosion platform; strand flat; wave-cut plain; wave-cut terrace; wave platform. { 'wāv ¦kət 'plat,förm }

wave-cut terrace *See* wave-cut platform. { 'wāv ¦kət 'ter·əs }

wave cyclone [METEOROL] A cyclone which forms and moves along a front; the circulation about the cyclone center tends to produce a wavelike deformation of the front. Also known as wave depression. { 'wāv ,sī,klōn }

wave delta *See* washover. { 'wāv ,del·tə }

wave depression *See* wave cyclone. { 'wāv di,presh·ən }

wave depth *See* wave base. { 'wāv ,depth }

wave disturbance [METEOROL] In synoptic meteorology, the same as wave cyclone, but usually denoting an early state in the development of a wave cyclone, or a poorly developed one. { 'wāv di,stər·bəns }

wave duct [ELECTROMAG] 1. Waveguide, with tubular boundaries, capable of concentrating the propagation of waves within its boundaries. 2. Natural duct, formed in air by atmospheric conditions, through which waves of certain frequencies travel with more than average efficiency. { 'wāv ,dəkt }

wave equation [PHYS] 1. In classical physics, a special equation governing waves that suffer no dissipative attenuation; it states that the second partial derivative with respect to time of the function characterizing the wave is equal to the square of the wave velocity times the Laplacian of this function. Also known as classical wave equation; d'Alembert's wave equation. 2. Any of several equations which relate the spatial and time dependence of a function characterizing some physical entity which can propagate as a wave, including quantum-wave equations for particles. { 'wāv i,kwā·zhən }

wave erosion *See* marine abrasion. { 'wāv i,rō·zhən }

wave filter [ELEC] A transducer for separating waves on the basis of their frequency; it introduces relatively small insertion loss to waves in one or more frequency bands and relatively large insertion loss to waves of other frequencies. { 'wāv ,fil·tər }

wave forecasting [OCEANOGR] The theoretical determination of future wave characteristics based on observed or forecasted meteorological phenomena. { 'wāv 'för,kast·iŋ }

waveform [PHYS] The pictorial representation of the form or shape of a wave, obtained by plotting the displacement of the wave as a function of time, at a fixed point in space. { 'wāv,förm }

waveform-amplitude distortion *See* frequency distortion. { 'wāv,förm ¦am·plə,tüd di,stör·shən }

waveform analysis [PHYS] The determination of the amplitude and phase of the components of a complex waveform, either mathematically or by means of electronic instruments. { 'wāv,förm ə,nal·ə·səs }

wavefront [PHYS] 1. A surface of constant phase. 2. The portion of a wave envelope that is between the beginning zero point and the point at which the wave reaches its crest value, as measured either in time or distance. { 'wāv,frənt }

wavefront reversal *See* optical phase conjugation. { 'wāv,frənt ri'vər·səl }

wavefront splitting [OPTICS] Any method of producing interference in which light from a single source is split into two parts which can then be recombined; examples include Young's two-slit experiment, the Fresnel double mirror, and the Fresnel biprism. { 'wāv,frənt 'splid·iŋ }

wave function *See* Schrödinger wave function. { 'wāv ,fəŋk·shən }

wave gage [ENG] A device for measuring the height and period of waves. { 'wāv ,gāj }

wave gait [MECH ENG] A mode of motion of a mobile robot with several legs in which its components have a wavy motion. { 'wāv ,gāt }

wave group [PHYS] A series of waves in which the wave direction, length, and height vary only slightly. { 'wāv ,grüp }

waveguide [ELECTROMAG] 1. Broadly, a device which constrains or guides the propagation of electromagnetic waves along a path defined by the physical construction of the waveguide; includes ducts, a pair of parallel wires, and a coaxial cable. Also known as microwave waveguide. 2. More specifically, a metallic tube which can confine and guide the propagation of electromagnetic waves in the lengthwise direction of the tube. { 'wāv,gīd }

waveguide assembly [ELECTROMAG] An item consisting of one or more definite lengths of straight or formed, flexible or rigid, prefabricated hollow tubing of conductive material; the tubing has a predetermined cross-section, and is designed to guide or conduct high-frequency electromagnetic energy through its interior; one or more ends are terminated. { 'wāv,gīd ə,sem·blē }

waveguide attenuation [ELECTROMAG] The decrease from one point of a waveguide to another, in the power carried by an electromagnetic wave in the waveguide. { 'wāv,gīd ə,ten·yə'wā·shən }

waveguide bend [ELECTROMAG] A section of waveguide in which the direction of the longitudinal axis is changed; an E-plane bend in a rectangular waveguide is bent along the narrow dimension, while an H-plane bend is bent along the wide dimension. Also known as waveguide elbow. { 'wāv,gīd ¦bend }

waveguide cavity [ELECTROMAG] A cavity resonator formed by enclosing a section of waveguide between a pair of waveguide windows which form shunt susceptances. { 'wāv,gīd ¦kav·əd·ē }

waveguide connector [ELECTROMAG] A mechanical device for electrically joining and locking together separable mating parts of a waveguide system. Also known as waveguide coupler. { 'wāv,gīd kə,nek·tər }

waveguide coupler *See* waveguide connector. { 'wāv,gīd ¦kəp·lər }

waveguide critical dimension [ELECTROMAG] Dimension of waveguide cross section which determines the cutoff frequency. { 'wāv,gīd 'krid·ə·kəl də'men·shən }

waveguide cutoff frequency [ELECTROMAG] Frequency limit of propagation along a waveguide for waves of a given field configuration. { 'wāv,gīd 'kəd,öf ,frē·kwən·sē }

waveguide discontinuity *See* discontinuity. { 'wāv,gīd dis,känt·ən'ü·əd·ē }

waveguide elbow *See* waveguide bend. { 'wāv,gīd ¦el·bō }

waveguide filter [ELECTROMAG] A filter made up of waveguide components, used to change the amplitude-frequency response characteristic of a waveguide system. { 'wāv,gīd ¦fil·tər }

waveguide hybrid [ELECTROMAG] A waveguide circuit that has four arms so arranged that a signal entering through one arm will divide and emerge from the two adjacent arms, but will be unable to reach the opposite arm. { 'wāv,gīd 'hī·brəd }

waveguide junction *See* junction. { 'wāv,gīd ¦jəŋk·shən }

waveguide plunger *See* piston. { 'wāv,gīd ¦plən·jər }

waveguide probe *See* probe. { 'wāv,gīd ¦prōb }

waveguide propagation [COMMUN] Long-range communications in the 10-kilohertz frequency range by the waveguide characteristics of the atmospheric duct formed by the ionospheric D layer and the surface of the earth. { 'wāv,gīd ,präp·ə'gā·shən }

waveguide resonator *See* cavity resonator. { 'wāv,gīd ¦rez·ən,äd·ər }

waveguide shim [ELECTROMAG] Thin resilient metal sheet inserted between waveguide components to ensure electrical contact. { 'wāv,gīd ,shim }

waveguide slot [ELECTROMAG] A slot in a waveguide wall, either for coupling with a coaxial cable or another waveguide, or to permit the insertion of a traveling probe for examination of standing waves. { 'wāv,gīd ,slät }

waveguide switch [ELECTROMAG] A switch designed for mechanically positioning a waveguide section so as to couple it to one of several other sections in a waveguide system. { 'wāv,gīd ,swich }

waveguide window *See* iris. { 'wāv,gīd ¦win·dō }

wave height [OCEANOGR] The height of a water-surface wave is generally taken as the height difference between the wave crest and the preceding trough. [PHYS] Twice the wave amplitude. { 'wāv ,hīt }

wave-height correction [NAV] A correction to a sextant altitude required because of the elevation of parts of the sea surface by wave action. { 'wāv ¦hīt kə'rek·shən }

WAVEFORM

$E_m \sin(2\pi t/T)$

sine wave

$$\frac{4E_m}{\pi} \sum_{n=1,3,5,\ldots} \frac{1}{n} \sin(2\pi nt/T)$$
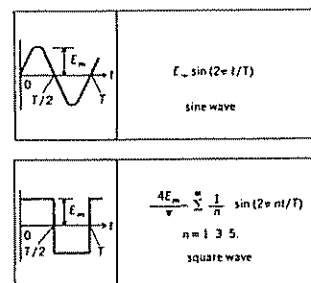
square wave

Waveforms of sine wave and square wave. Fourier series for waveforms are given at right as functions of time t. E_m is maximum value of wave. T is period of wave.